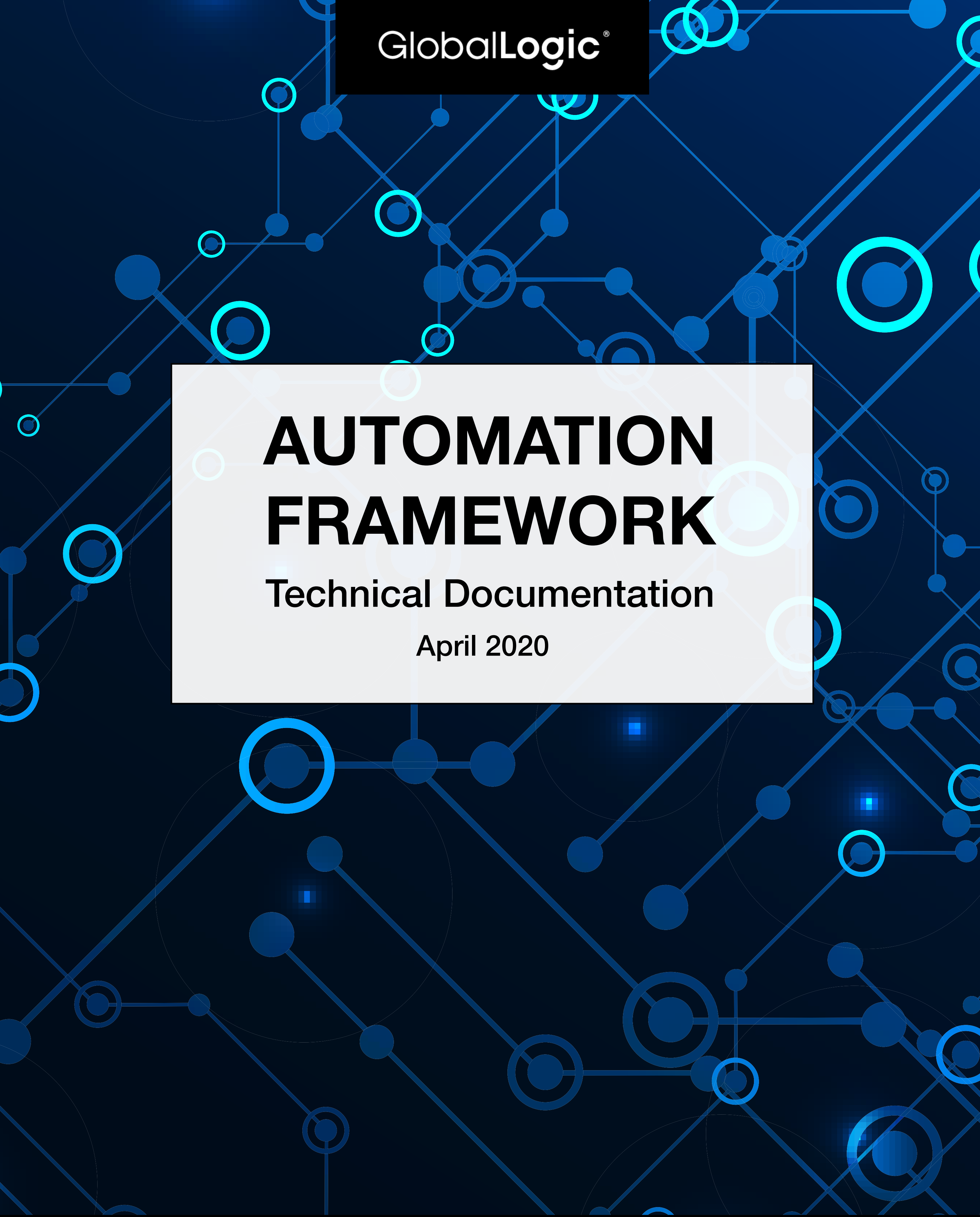
GlobalLogic®

# AUTOMATION FRAMEWORK

## Technical Documentation

April 2020



## Overview of BDD testing

Behavior-driven development or BDD  is a more accessible and effective way for teams new to agile software delivery to test business behavior, rather than a computer function.

BDD approach uses basic concepts of “given, when, then” to describe various user scenarios. It offers an improvement in communication methods between product owners, developers, testers, and users with or without a testing tool. BDD is commonly used with automation using Gherkin and combined with unit testing.

### Advantages of BDD

- Automation engineers no longer define ‘test’ but are defining ‘behavior.’
- Communication of business requirements between developers, testers, and product owners improves.
- The learning curve is much shorter when explaining BDD  as it uses simple language.
- Being non-technical, it can reach a wider audience.
- The behavioral approach defines acceptance criteria before development.

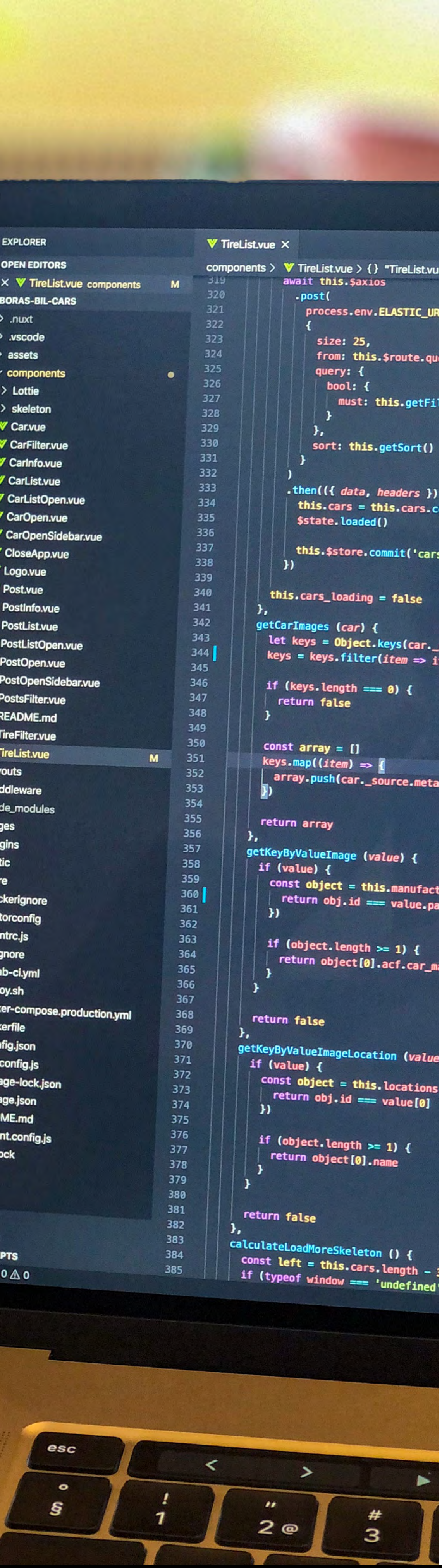
BDD helps develop, test, and think about the code from the business owner’s point of view.

## Common problems with automation

Here are some of the common problems faced by the Automation QA while automating scripts. These must be addressed at the beginning of the development to avoid inefficiency and code repeatability later on.

### Code Duplication

Most mobile development applications are developed on multiple platforms, commonly on iOS and Android. When developers try to automate application functionality, they need to write the same script multiple times to support all platforms that led to code duplication.



It also includes duplication of code in debugging tools like taking screenshots, video recording, and logs management.coming from. When an IP spoofing attack occurs, this source details that IP address specifies the sender of the packet is not actual, but a fraudulent IP address which is permitted to access the website. This will make the server handle the request packet as it is coming from the permitted user. Then the server will grant access to the attacker causing various security threats.

## Test Suite

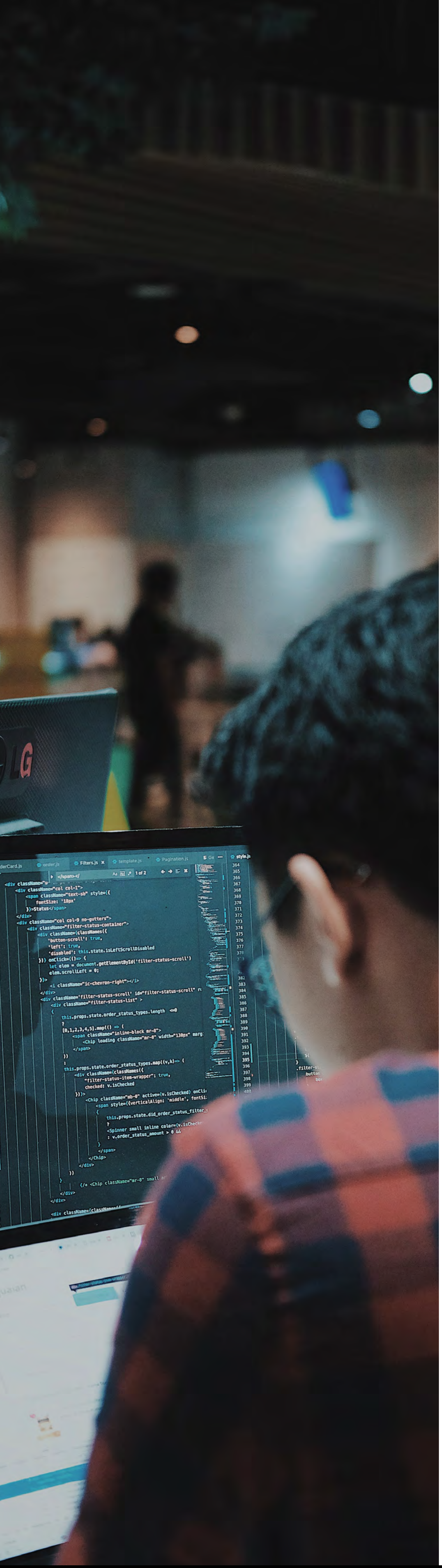
After developing scripts, the developer's second most common challenge is to create the test suite to execute particular scripts as per the client's requirements. In some cases, there is also a need to run scripts based on conditions like:

- Executing specific tests instead of a complete package.
- Executing platform-specific tests, for example, Android-only or iPhone-only.
- Conducting tests with simulators.
- Executing tests dependent on real devices.

## Custom Report

The most important aspect of any action is its result and, in the case of automation, its execution report. However, the most commonly used automation does not provide us with detailed information that can identify the exact cause of the failure.

To overcome these problems, we have developed an Automation framework for accessing automation functionalities, based on the Spock Framework.

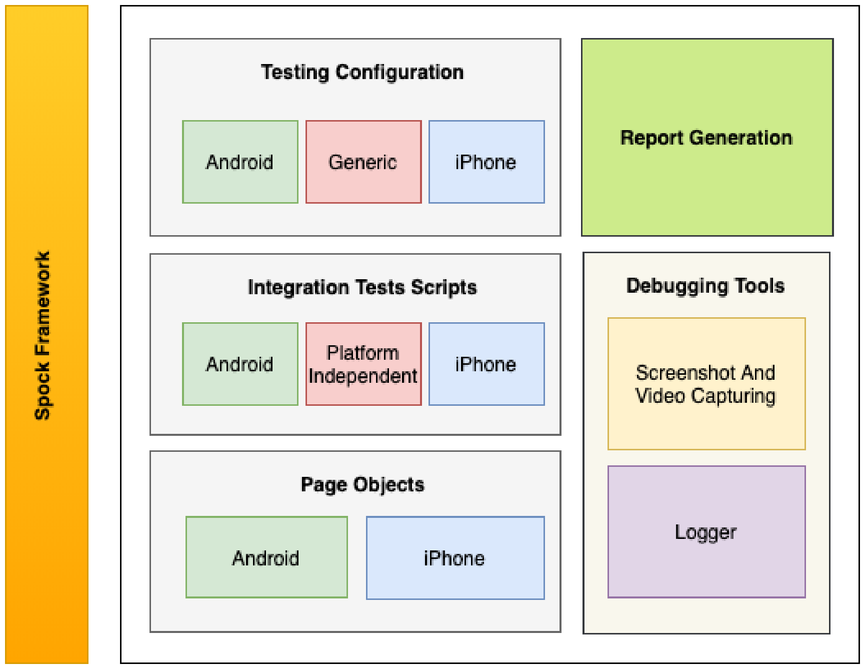


## Overview of the Spock framework

Spock is a test automation framework that uses Groovy to write automation scripts and forces automation developers to follow BDD conventions. The Spock framework also supports parameterized test scenarios that help in testing particular scenarios with different conditions.

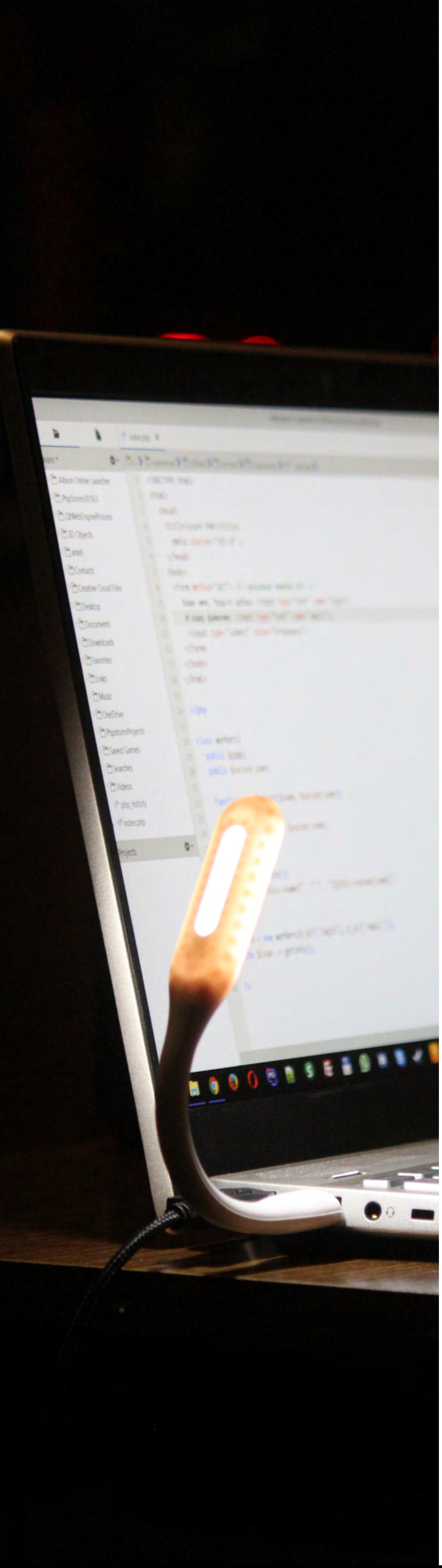
### Our Customized Automation Framework

The diagram below gives insight into how the framework works.



This framework aims to provide the initial platform the ability to write integration tests of the multi-platform application. It is based on the following stacks:

- Appium
- Spock framework
- Groovy
- Java



## Components of Framework

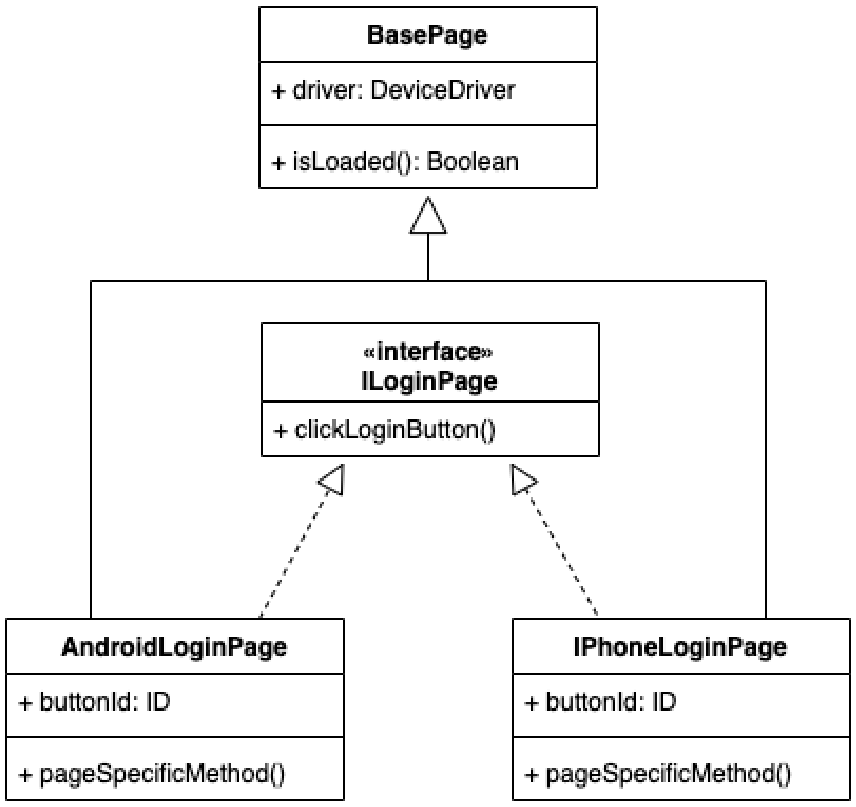
The framework consists of the following major components:

1. Page Objects
2. Integration Tests
3. Custom Debugging Tools
4. Reports Generation

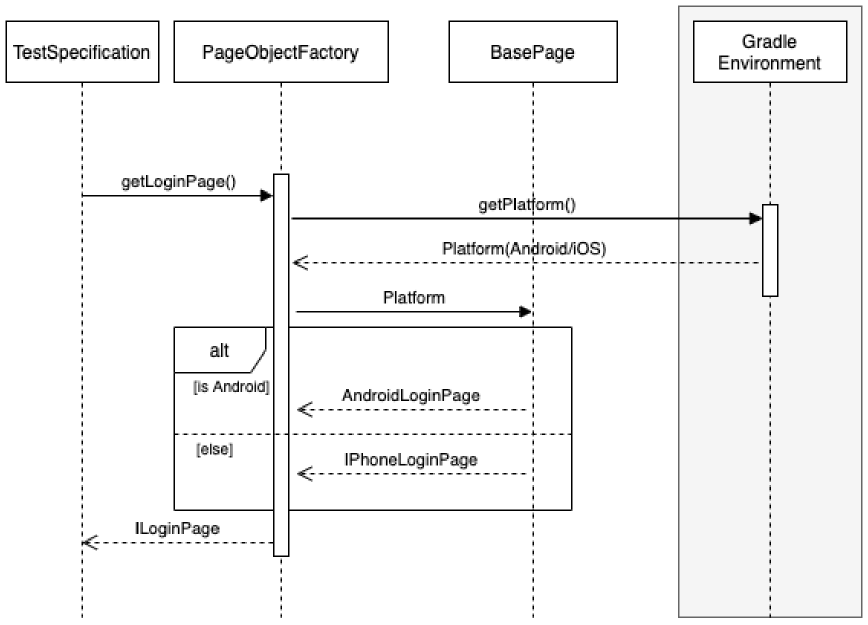
### 1. Page Objects

This component provides the application screens in an easily accessible format. The page object is created based on the platform value passed in the Gradle environment. All action methods are accessible only through the standard interface.

Class diagram of Page classes:



Sequence diagram for PageObject creation:



PageObject consists of the following major components:

- Pages(Screen)
- Page Modules
- Other Utilities
- Application.java(App flow)

## Pages(Screen)

One of the most critical parts of the framework, Pages(Screen) interacts directly with the UI screen and performs all activities related to the user interface on behalf of the user.

## Page Modules

Page Modules combine the typical set of methods to call to perform a particular sequence in the application. It helps connect processes like entering a username, entering a password, and clicking the Login button for login functionality.

## Utilities

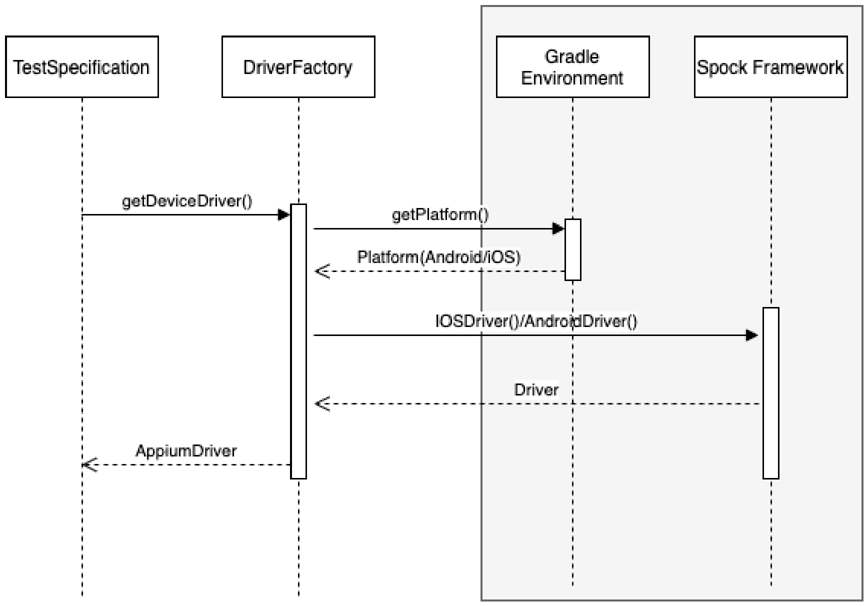
This contains the utility classes used in different modules such as Constants, Formatters, classes to access property files, and interacting with files to extract necessary information.

## Application.java

This handles those functionalities not specific to the particular screen. In other words, it works on the application level to maintain the states. Application.java handles specific scenarios such as common alerts, notifications that can appear on any screen.

## 2. Integration Tests

This is where automation scripts are written using Gherkin statements. A platform-specific device driver acts as a bridge to interact with the device screen for executing any scripts. The following sequence diagram provides clarity on how the device driver creation happens.



## 3. Debugging

This component provides debugging tools to investigate test failures. It consists of the following sub-components:

- Screenshots and video capturing
- File logging

### Screenshots

This provides the ability to capture device screenshots in case of a test failure, so the developer can configure it to capture periodically. Developers can also configure to capture a video recording of each scenario execution. Save captured files in a folder with the test ID name and a filename titled for each scenario.

### File logging

This provides the ability to capture logs generated during test execution into the file for debugging. Save generated files in their respective test ID folders. The filename here is also the title of each scenario.

## 4. Reports Generation

This component can generate test reports, customize using CSS, and  provide the capability to add details such as:

- Tests count
- Test passed
- Test failed
- Passing percentage
- Platform information
- Scenario details
- Total time taken for execution
- Test ID, which can be linked with the project management tools
- And many more.

## References

### Online Resource

- http://spockframework.org/